

REMARKS

In the Office Action, dated October 21 2003, the Examiner states that Claims 1-14 are pending, Claims 1-9 and 11-14 are rejected, and Claim 10 is withdrawn. By the present Amendment, Applicant amends the claims.

In the Office Action, Claims 1-9 and 11-12 are rejected under 35 U.S.C. §103(a) as being unpatentable over Thomas et al. (WO 93/24243). Claims 13 and 14 are rejected under 35 U.S.C. §103(a) as being unpatentable over Thomas et al. in view of Koji et al. (JP 4210464). The Applicant considers that the amendments to the claims overcome these rejections.

As shown in Fig. 11 and Fig. 12, a silicon oxide film in a gas barrier film of the present invention is formed by a plasma CVD method in which an electric field is applied to both of an organic silicon compound gas and a gas having oxygen atoms.

In the gas barrier film of the present invention, organic silicon compound molecules in organic silicon compound gas are actively disbonded by applying an electric field to both of an organic silicon compound gas and a gas having oxygen atoms, thereby carbon components contained in the silicon oxide film or the gas barrier film are removed. As a result, by eliminating the carbon components in the silicon oxide film as mentioned above, the structure of the silicon oxide film becomes more compact. Therefore, the gas barrier property can be greatly improved. These features have been amended into the claims.

On the other hand, in the invention of Thomas et al., as shown in Fig. 1, oxidizing gas goes through the interior space 48 which takes up a majority of the plasma chamber, and organosilicon goes through a conduit formed from a capillary in the interior space 48. And further, in the invention of Thomas et al., as mentioned on lines 6 to 19 of page 15 of that reference, organosilicon is not practically influenced by an electric field.

As mentioned above, since organosilicon molecules are not actively disbonded in the invention of Thomas et al., there are more carbon components in the silicon oxide film, compared to the present invention. Particularly, Si-C bonding in an organosilicon molecule is difficult to disbond unless a strong energy is applied.

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Unless the disbonding of Si-C bonding is carried out effectively, elimination of carbon components in the silicon oxide film is not possible even though the added amount of the oxidizing gas is increased. Therefore, the silicon oxide film in the invention of Thomas et al. cannot have as compact a structure as the silicon oxide film of the present invention.

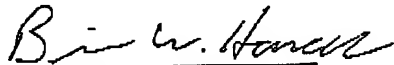
As explained above, the silicon oxide film of the invention of Thomas et al. and the silicon oxide film of the present invention particularly differ in the amount of the carbon components in the film, and therefore, differ greatly in the compactness of the silicon oxide film.

Therefore, the Applicant considers the present invention as claimed is not obvious from the invention of Thomas et al., or Koji et al., and respectfully requests that the rejections to the claims be withdrawn.

In light of the foregoing response, all the outstanding objections and rejections have been overcome. Applicant respectfully submits that this application should now be in better condition for allowance and respectfully requests favorable consideration.

Respectfully submitted,

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Date


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